EPA Region 7 TMDL Review

TMDL ID	6	*Water Body ID*	IA 05-GRA-01010-L
Water Body Name	Nine Eagles Lake		
Pollutant	Turbidity		
Tributary	Unnamed intermittent streams		
State	IA	*HUC*	1110280102050
Basin	Southern Iowa River Basin		
Submittal Date	12/28/2000		
Approved	Yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Letter to EPA formally submitting this TMDL dated December 28, 2000, received December 28, 2000, via fax.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Nine Eagles Lake was listed as impaired due to high turbidity following high rainfall events. Iowa does not have a numeric criterion for turbidity or siltation in their WQS, however, the lake violated the narrative WQS that states, "waters shall be free from materials attributable to wastewater discharges or agricultural practices producing objectionable color, odor, or other aesthetically objectionable conditions" (IAC 567-61.3(1)). A 50% annual reduction in the amount of sediment entering the lake should result in achievement of the targeted endpoint and in attainment of the narrative WQS for turbidity.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

All designated beneficial uses are described as well as the pertinent narrative expression that is site specific for Nine Eagles Lake and interprets the narrative WQS. Secchi depth was chosen as the indicator for turbidity since it is an acceptable form of measurement for the depth of visibility or transparency of a lakes water column, and because there is a small body of information that exists with respect to historical secchi disk depth at the lake. A Clean Lake Restoration Project (Bonneau, 1999) and available secchi depth data for the lake were used to determine the endpoint of 1.25 meters secchi depth.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The process used for describing the reductions needed to achieve the target identifies calculated sediment delivery estimates to the lake using the Iowa Small Structures Design Manual developed by the Soil Conservation Service (SCS 1985). Calculations were made for each of the seven subwatersheds in the watershed using the sediment delivery equation developed by the SCS. A trap efficiency factor was calculated for those areas protected by structures and those without protective structures were accounted for as well. The annual amount of sediment delivery was determined and the 50% reduction in this current loading was determined to result in improved secchi depth readings such that lake water column clarity would be greatly improved. Analysis of historic secchi depth readings from previous water quality projects support the theory that a 1.25 secchi depth reading could occur with a 50% reduction in sediment delivery to the lake.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Water quality studies have been completed on Nine Eagles Lake by the University of Iowa Hygienic Laboratory (1986), by Iowa State University for the Clean Lakes Classification Study (1979, 1990), and by the University of Missouri (algal toxin project, 1999). Data from all three projects was analyzed along with the land use cover, soil profiles and topography of the watershed. About 90% of the watershed is parkland which is primarily woodland. Nonpoint source gully and streambank erosion resulting from high precipitation events, coupled with highly erodable soils in the watershed are found to be the source of the impairment to the lake. There are no point source contributions.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The current sediment delivery to the lake is 7,264 tons/year. The load capacity established to support the targeted endpoint is 3,633 tons/year of sediment delivered to the lake - a 50% reduction in sediment delivery.

WLA Comment

The WLA is zero.

LA Comment

The LA, incorporating a MOS, is 3,270 tons of sediment delivered to the lake per year.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The MOS is incorporated into the load allocation by deducting 10% from the loading capacity of each of the seven subwatersheds in the Nine Eagles Lake watershed.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Seasonal variation and critical conditions are considered as expectations that the majority of all erosion occurring in the Nine Eagles Lake watershed occurs in the spring and early summer during periods of high rainfall.

Public Participation

Submital describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

A public meeting regarding the Nine Eagles Lake TMDL was held on November 15, 2000 in Leon, Iowa. Public comments were received until December 15, 2000, and where appropriate, were incorporated into the final TMDL.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

The TMDL offers implementation strategies for the repair and construction of protective structures that will reduce the amount of sediment delivery to the lake. Bathymetric mapping of the lake will be completed by 2002 as well as additional water quality monitoring to be completed as part of the Iowa Lakes Survey. Lake water monitoring will

be completed three times per year for each of the field seasons 2000-2005.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.
